

REMARKS

Claims 1-14 and 28-52 were pending in this application, with claims 12-14 and 37 withdrawn from consideration, when the present Office Action was mailed (October 30, 2007). In this response, claims 1, 6-8, 28, 30-33, 44, 46 and 47 have been amended without prejudice to pursuing these claims in unamended or other forms in a continuation or other application. Claim 38 has been canceled. Accordingly, claims 1-14, 28-37 and 39-52 are currently pending.

In the present Office Action, claims 1-11, 28-36 and 38-52 were rejected. More specifically, the status of the application in light of this Office Action is as follows:

(A) Claims 1, 9, 10, 28, 29, 33, 36, 38-45 and 48-52 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,809,421 to Hayasaka et al. ("Hayasaka");

(B) Claim 2 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Hayasaka in view of U.S. Patent No. 7,045,015 to Renn et al. ("Renn");

(C) Claims 3 and 34 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Hayasaka in view of U.S. Patent Application Publication No. 2004/0023447 to Hirakata et al. ("Hirakata");

(D) Claims 31 and 46 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Hayasaka in view of U.S. Patent No. 6,703,310 to Mashino et al. ("Mashino") and Hirakata;

(E) Claims 4 and 35 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Hayasaka in view of U.S. Patent Application Publication No. 2004/0087441 to Bock et al. ("Bock");

(F) Claims 6-8, 11 and 30 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Hayasaka in view of Mashino;

(G) Claims 32 and 47 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Hayasaka in view of Mashino and Bock; and

(H) Claim 5 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Hayasaka in view of U.S. Patent No. 6,828,223 to Chuang ("Chuang").

The undersigned attorney and his colleague, Joe Brennan, wish to thank the Examiner and her supervisor, Examiner Gurley, for engaging in a telephone interview on January 22, 2008 to discuss the present Office Action. During the telephone interview, claims 1, 6 and 39 and the Hayasaka and Mashino references were discussed.

The following remarks summarize and expand on the points discussed during the January 22nd telephone interview, and reflect the agreements reached between the undersigned attorney and the Examiner during the telephone interview. For example, during the course of the telephone interview, the Examiner agreed that Hayasaka fails to teach or suggest the features of claim 1 as amended. The applicants request that this paper constitute the applicants' Interview Summary. If the Examiner notices any deficiencies in this regard, the Examiner is encouraged to contact the undersigned

A. Response to the Section 102(e) Rejections of Claims 1, 9, 10, 28, 29, 33, 36, 38-45 and 48-52

Claims 1, 9, 10, 28, 29, 33, 36, 38-45 and 48-52 were rejected under 35 U.S.C. § 102(e) as being anticipated by Hayasaka. Without commenting on or conceding the merits of these rejections, independent claims 1, 28, 33, 39 and 44 have been amended to further clarify the claimed subject matter.

During the course of the January 22nd telephone interview, the Examiner agreed that Hayasaka does not teach or suggest the features of amended claim 1. More specifically, the Examiner agreed that Hayasaka does not teach or suggest "forming an open passage extending through the microfeature workpiece from a first side of the microfeature workpiece to an opposite second side of the microfeature workpiece" in combination with "after forming the passage, forming a conductive plug in the passage adjacent to the first side of the microelectronic workpiece." For at least this reason, the Section 102 rejection of claim 1 should be withdrawn.

Claims 9, 10 and 48 depend from base claim 1. Accordingly, the Section 102 rejections of claims 9, 10 and 48 should be withdrawn for at least the foregoing reason, and for the additional features of these dependent claims.

Amended claims 28 and 33, unamended claim 39 and amended claim 44 also recite features that are not taught or suggested by Hayasaka. For example, claim 28 recites, *inter alia*, "a passage extending completely through the die and aligned with and extending through the bond-pad." Claim 33 recites, *inter alia*, "a passage extending completely through the bond-pad and the die from the first side of the microfeature workpiece to the second side of the microfeature workpiece." Claim 39 recites, *inter alia*, "a first die with a first integrated circuit and a first bond-pad electrically coupled to the first integrated circuit, the first die further including a passage extending completely through the first die and the first bond-pad." Claim 44 recites, *inter alia*, "a first die with a first integrated circuit and a first bond-pad electrically coupled to the first integrated circuit, the first die further including a passage aligned with and extending through the first bond-pad." With regard to these claims, the Office Action correctly notes that Hayasaka does not disclose or suggest a passage extending through a bond-pad. (*See* Office Action at pp. 13 and 14, stating "Hayasaka fails to disclose wherein forming the passage extends through the bond-pad.") For at least this reason, the Section 102 rejections of claims 28, 33, 39 and 44 should be withdrawn.

Moreover, Hayasaka cannot support Section 103 rejections of claims 28, 33, 39 and 44. Hayasaka describes a pad 17 that is either formed in a groove in a multilevel interconnection structure 16 on a silicon substrate 10 (*see, e.g.*, Figures 7F-I; col. 13:1-8) or placed on a surface of the multilevel interconnection structure 16 (*see, e.g.*, Figure 15). The purpose of the pad 17 is to electrically connect its corresponding chip with the chip stacked on top of it. (*See, e.g.*, Figures 4 and 15 and col. 10:30-34.) Hayasaka describes using a mask 12 to form the hole 13 that passes through a first interlayer insulating film 11 but not through the silicon substrate 10. (Hayasaka Figure 7B; col. 12:16-23.) However, the hole 13 does not extend through the pad 17. (*See, e.g.*, Figures 7F-7I.) In order for the pad 17 to have the hole 13 extend through it, the pad 17 would have to be placed either directly on the silicon substrate 10 or on the first interlayer insulating film 11 before the hole 13 is formed. (*See, e.g.*, Figures 7A and 7B, showing the

hole 13 in the first interlayer insulating film 11 and the silicon substrate 10.) However, if this were to be the case, in either placement the pad 17 would be covered by the multilevel interconnection structure 16 when it is formed over the film 11. (See, e.g., Figure 7F, showing the multilevel interconnection structure 16 over the film 11.) The multilevel interconnection structure 16 would prevent the pad 17 from contacting a solder bump 8, thus preventing the corresponding chip from being electrically connected to the chip stacked on top of it. Such a modification would render Hayasaka unsatisfactory for its intended purpose of electrically connecting stacked chips. "If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 U.S.P.Q. 1125 (Fed. Cir. 1984)." (MPEP 2143.01.) For at least this reason, Hayasaka cannot support Section 103 rejections of claims 28, 33, 39 and 44.

Hayasaka cannot support Section 103 rejections of claims 28, 33, 39 and 44 for at least one additional reason. Hayasaka describes another pad 33 adjacent to and below a metal plug 15 of a chip. A metal ball 34 is attached to the pad 33 to allow the chip to have an electrical connection with the chip below it. (See Figure 15.) Hayasaka describes that the hole 13 stops short of the pad 33. Specifically, Hayasaka states "Where chips are connected together as shown in FIG. 15, a pad 33 and a metal ball 34 made of gold are formed after the metal plug 15 has been formed [in the hole 13]." (Col. 16:65-67.) Because Hayasaka describes that the hole 13 has already been filled by the metal plug 15 when the pad 33 is formed, the hole 13 cannot extend through the pad 33. Therefore, Hayasaka teaches away from the hole 13 extending through the pad 33. "It is improper to combine references where the references teach away from their combination. *In re Grasselli*, 713 F.2d 731, 743, 218 U.S.P.Q. 769, 779 (Fed. Cir. 1983)." (MPEP 2145.) For at least this additional reason, Hayasaka cannot support Section 103 rejections of claims 28, 33, 39 and 44.

Claim 38 has been canceled and accordingly, the outstanding rejection of this claim is now moot. Claims 29 and 49 depend from base claim 28, claims 36 and 50 depend from base claim 33, claims 40-43 and 51 depend from base claim 39, and claims 45 and 52 depend from base claim 44. As a result, the Section 102 rejections of claims 29, 36, 40-43, 45 and 49-52

should be withdrawn for at least the foregoing reasons and for the additional features of these dependent claims.

B. Response to the Section 103(a) Rejection of Claim 2

Claim 2 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Hayasaka in view of Renn. Claim 2 depends from base claim 1. As previously noted, Hayasaka does not teach or suggest the features of base claim 1, and Renn fails to cure these deficiencies. As a result, the Section 103 rejection of claim 2 should be withdrawn for at least the reasons set forth above with regard to base claim 1, and for the additional features of this dependent claim.

C. Response to the Section 103(a) Rejections of Claims 3 and 34

Claims 3 and 34 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Hayasaka in view of Hirakata. Claim 3 depends from base claim 1, and claim 34 depends from base claim 33. As previously noted, Hayasaka does not teach or suggest the features of base claims 1 and 33, and Hirakata fails to cure these deficiencies. As a result, the Section 103 rejections of claims 3 and 34 should be withdrawn for at least the reasons set forth above with regard to base claims 1 and 33, and for the additional features of these dependent claims.

D. Response to the Section 103(a) Rejections of Claims 31 and 46

Claims 31 and 46 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Hayasaka in view of Mashino and Hirakata. Claim 31 depends from base claim 28, and claim 46 depends from base claim 44. As previously noted, Hayasaka does not teach or suggest the features of base claims 28 and 44, and Mashino and Hirakata, alone or in combination, fail to cure these deficiencies. As a result, the Section 103 rejections of claims 31 and 46 should be withdrawn for at least the reasons set forth above with regard to base claims 28 and 44, and for the additional features of these dependent claims.

E. Response to the Section 103(a) Rejections of Claims 4 and 35

Claims 4 and 35 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Hayasaka in view of Bock. Claim 4 depends from base claim 1, and claim 35 depends from base claim 33. As previously noted, Hayasaka does not teach or suggest the features of base claims 1

and 33, and Hirakata fails to cure these deficiencies. As a result, the Section 103 rejections of claims 4 and 35 should be withdrawn for at least the reasons set forth above with regard to base claims 1 and 33, and for the additional features of these dependent claims.

F. Response to the Section 103(a) Rejections of Claims 6-8, 11 and 30

Claims 6-8, 11 and 30 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Hayasaka in view of Mashino. Claims 6-8 and 11 depend from base claim 1, and claim 30 depends from base claim 28. As previously noted, Hayasaka does not teach or suggest the features of base claims 1 and 28, and Mashino fails to cure these deficiencies. As a result, the Section 103 rejections of claims 6-8, 11 and 30 should be withdrawn for at least the reasons set forth above with regard to base claims 1 and 28, and for the additional features of these dependent claims.

G. Response to the Section 103(a) Rejections of Claims 32 and 47

Claims 32 and 47 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Hayasaka in view of Mashino and Bock. Claim 32 depends from base claim 28, and claim 47 depends from base claim 44. As previously noted, Hayasaka does not teach or suggest the features of base claims 28 and 44, and Mashino and Hirakata, alone or in combination, fail to cure these deficiencies. As a result, the Section 103 rejections of claims 32 and 47 should be withdrawn for at least the reasons set forth above with regard to base claims 28 and 44, and for the additional features of these dependent claims.

H. Response to the Section 103(a) Rejection of Claim 5

Claim 5 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Hayasaka in view of Chuang. Claim 5 depends from base claim 1. As previously noted, Hayasaka does not teach or suggest the features of base claim 1, and Chuang fails to cure these deficiencies. As a result, the Section 103 rejection of claim 5 should be withdrawn for at least the reasons set forth above with regard to base claim 1, and for the additional features of this dependent claim.

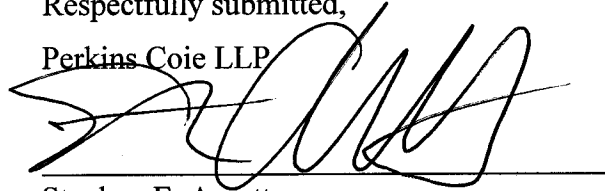
I. Conclusion

In view of the foregoing, the pending claims comply with 35 U.S.C. § 112 and are patentable over the applied art. The Applicants accordingly request reconsideration of the application and a Notice of Allowance. If the Examiner has any questions or believes a telephone conference would expedite prosecution of this application, the Examiner is encouraged to contact Stephen Arnett at (206) 359-6351.

Date: Jan 30, 2008

Respectfully submitted,

Perkins Coie LLP



Stephen E. Arnett
Registration No. 47,392

Correspondence Address:

Customer No. 25096
Perkins Coie LLP
P.O. Box 1247
Seattle, Washington 98111-1247
(206) 359-8000